



# Wind Chill Chart



		Temperature (°F)																	
		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind (mph)	Calm	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	5	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	10	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	15	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
	20	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	25	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	30	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	35	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	40	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	45	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	50	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
55	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	

Frostbite Times: 30 minutes (light blue), 10 minutes (medium blue), 5 minutes (dark blue)

**Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V<sup>0.16</sup>) + 0.4275T(V<sup>0.16</sup>)**  
 Where, T= Air Temperature (°F) V= Wind Speed (mph) Effective 11/01/01

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A lot of people like snow. I find it to be an unnecessary freezing of water.  
 ~ Carl Reiner



# SKY SCANNER

National Weather Service Forecast Office  
 Aberdeen, South Dakota

October 2004

## Winter Weather Preparedness Week

October 25th-29th...South Dakota  
 November 8th-12th...Minnesota

Winter is right around the corner, so it's time to start preparing for another northern plains winter. Winter Weather Preparedness Week is October 25th-29th for South Dakota...and November 8th-12th for Minnesota. This week is set aside as a time to review your plans and get ready for winter. The National Weather Service (NWS) has set up a Winter Weather Awareness Page on the internet at <http://www.nws.noaa.gov/om/winter/>. This site contains general preparedness information, as well as links to other agencies such as the Red Cross and Federal Emergency Management Agency. There are also links to specific winter weather threats and aids, such as Wind Chill Charts and long lead time climatic outlooks.

Knowing what products the NWS issues will keep you informed and let you plan your winter activi-

ties safely. In addition to issuing daily forecasts, the NWS issues specific products to alert you to impending dangerous weather situations. Following are four of the most important winter weather products we issue.

- 1) A Winter Storm Watch is a heads up...generally issued 12 to 48 hours in advance of the expected winter storm.
- 2) A Winter Storm Warning is issued when 6 inches or more of snow is forecast to accumulate in a 12 hour period, or 8 inches in 24 hours, or lesser amounts when combined with wind, sleet or freezing precipitation.
- 3) A Blizzard Warning is issued when winds are expected to exceed 35 mph combined with falling or blowing snow that will restrict the visibility to less than 1/4 of a mile for 3 hours or more.
- 4) An Ice Storm Warning is issued when ice accumulations of 1/4 inch or more are expected.

Also, the NWS will issue advisories for less threatening conditions, such as...  
 Snow accumulations up to 5 inches in 12 hours.  
 Mixtures of snow, sleet, freezing rain and/or drizzle.  
 Freezing precipitation with accumulations of less than 1/4 inch.  
 Widespread wind chills less than -20°F with winds greater than 10 mph.  
 Blowing snow reducing visibilities to 1/2 mile or less.

For more information contact the NWS office in Aberdeen at 225-0519.

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# Charles Hanson of Artichoke Lake, MN receives Thomas Jefferson Award for 32 years of outstanding cooperative observer service



From left to right: Tim Kearns, National Weather Service Data Acquisition Program Manager, Charles Hanson, Pam Hanson, Ken Gillespie, National Weather Service Hydrometeorological Technician



**We're on the Internet**  
<http://www.crh.noaa.gov/abr>



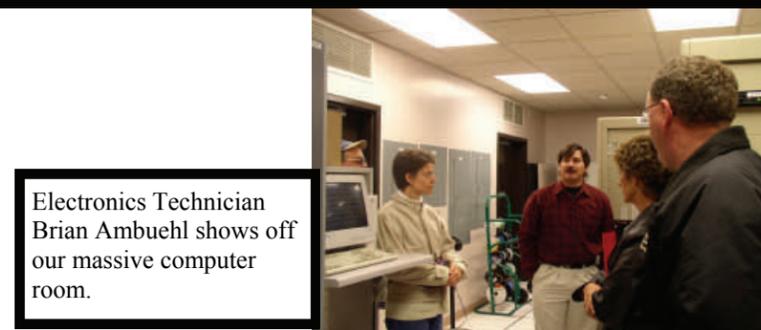
# National Weather Service Open House held on October 2nd

The National Weather Service Forecast Office in Aberdeen held an open house from 10am to 2pm on Saturday, October 2nd. Staff members led tours of the office, radar building, and upper air building. The kids that attended made barometers (measures pressure) and anemometers (measures wind speed) that they got to take home with them. Cookies and pop were served. One hundred thirty one people attended the open house, making it a rousing success.

We would like to thank everyone who took the time to come out and see what we do. Below are a couple of pictures from the day.



Meteorologist-in-charge Bill Tallman tends the refreshment table.



Electronics Technician Brian Ambuehl shows off our massive computer room.



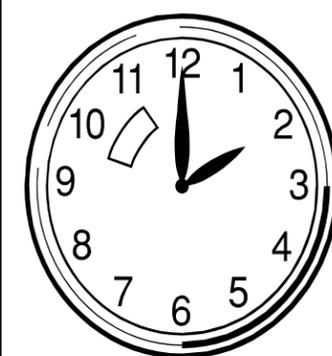
Data Acquisition Program Manager Tim Kearns explains NOAA Weather Radio to the ladies from the Red Hat Society.



Meteorologist Ryan Knutsvig helps a group of kids with their science experiments.



**Don't forget to set your clocks back an hour.**  
**October 31st**  
**at**  
**2:00 am**



## NOAA'S NEW GLOBAL CLIMATE FORECAST SYSTEM INCREASES CONFIDENCE THAT WEAK EL NIÑO CONDITIONS ARE DEVELOPING

Scientists from the National Oceanic and Atmospheric Administration are becoming increasingly confident weak El Niño conditions are developing in the tropical Pacific, based in part on a new Climate Forecast System that became operational today. The Climate Forecast System was developed at NOAA's Environmental Modeling Center (EMC) in collaboration with NOAA's Office of Oceanic and Atmospheric Research (OAR). NOAA is an agency of the U.S. Department of Commerce.

"NOAA expected weak El Niño conditions to develop by the end of August," said retired Navy Vice Adm. Conrad C. Lautenbacher, Ph.D., under secretary of commerce for oceans and atmosphere and NOAA administrator. "The Climate Forecast System complements our other models and gives NOAA increased confidence that weak El Niño conditions will develop in the central Pacific." However, at this time it is not clear what, if any, impacts this event will have on ocean temperatures in the classical El Niño region along the west coast of South America. "Presently, NOAA does not anticipate significant impacts from this potential El Niño in the U.S.," he added.

Under development for a year by a team of NOAA scientists, the Climate Forecast System is a coupled model approach, representing the interaction between the Earth's oceans and the atmosphere. These interactions are critical for determining climate on seasonal time scales.

"The system is already pushing the boundaries of science and effectively complementing NOAA's existing seasonal forecasting process," said retired Air Force Brig. Gen. David L. Johnson, director of NOAA's National Weather Service. "The Environmental Modeling Center is an important part of the National Weather Service mission in that they develop numerical models that provide climate, weather and water products and services for America. The new Climate Forecast System is the beginning of a new era for climate forecasting, leading to potential improvements in U.S. seasonal outlooks."

These outlooks provide guidance to customers in various economic sectors, including agriculture, energy, water resources, transportation, and the financial markets, on national weather well in advance of a particular season.

"The Climate Forecast System is the first fully global coupled prediction system developed at NOAA that produces a set of operational seasonal forecasts using an interactive ocean-land-atmosphere system," said Dr. Hua-Lu Pan, EMC's climate modeling team leader. "This system attempts to more accurately depict the actual physical processes that occur in nature."

Historically, operational climate forecasts have relied mostly on the knowledge of present and past conditions to make projections about future events. Current methods are based largely on statistical relationships and the physical laws that govern climate. Now, armed with the Climate Forecast System, NOAA scientists are using improved dynamic methods to predict the future behavior of the climate, which entails solving extremely complex mathematical equations on the NOAA weather and climate supercomputer.

NOAA declares the onset of El Niño conditions when the 3-month average sea-surface temperature departure exceeds 0.5°C in the east-central equatorial Pacific [between 5°N-5°S and 170°W-120°W]. To be classified as a full-fledged El Niño episode, these conditions must be satisfied for a period of at least five consecutive three-month seasons.

El Niño and its sister La Niña are associated with changes in sea surface temperatures in the tropical Pacific Ocean and can have significant impacts on weather around the world, including the United States. El Niño episodes occur about every four to five years and can last up to 12 to 18 months.

NOAA will continue monitoring El Niño developments and provide monthly updates. NOAA last updated its El Niño/Southern Oscillation (ENSO) Diagnostic Discussion and Outlook on September 9, 2004.

NOAA is dedicated to enhancing economic security and national safety through the prediction and research of weather and climate-related events and providing environmental stewardship of our nation's coastal and marine resources.

## Record Cool Summer by Dan Mohr

The summer of 2004 (June through August) will go down as one of the coldest summers on record for central and northeast South Dakota. Many record lows were set this past summer along with record cool high temperatures. With the jet stream diving southeast across the northern plains for much of the summer, many cool Canadian air masses invaded the region. Aberdeen, Sisseton, and Mobridge had their third coldest summer based on 110 years of data, while Pierre had its fourth coldest, and Watertown tied for its fifth coldest summer on record. The average summertime temperatures ranged from 67.9 degrees at Watertown to 72.8 degrees at Pierre. For the summer of 2004, the average temperature was 3 to 4 degrees below normal across central and northeast South Dakota. Aberdeen and Sisseton also recorded their coldest August in over 100 years. Pierre and Mobridge had their third coldest August, with Watertown's ranking fourth.

Following the record cool summer across central and northeast South Dakota, September ended up as one of the wettest on record for Sisseton, Pierre, and Watertown. In fact, September 2004 for Sisseton was the wettest in recorded history. Sisseton was about 4 1/2 inches above normal for September while Pierre was over 3 inches above normal. Also after a record cold August, the average September temperature was 2 to 5 degrees above normal across central and northeast South Dakota. In fact, the average temperature for September 2004 was very close to the average August 2004 temperature. For the first time in recorded history, Sisseton was warmer in September than it was in August. September in Sisseton was three tenths of a degree warmer than August. Watertown was only four tenths of a degree cooler in September than in August.

During the summer of 2004, the warmest temperature at Aberdeen was only 90 degrees, with the warmest temperature of the year of 92 degrees actually occurring in September. Pierre normally reaches 100 degrees or higher several times during the summer months, but for this year, Pierre only reached the century mark twice, 101 on July 18th and 100 on August 1st. Also,

Mobridge only hit 100 degrees twice from June through August. Watertown rose to 90 degrees or above only twice this summer; 90 and 91 on July 19th and 21st, respectively. In Sisseton, the high temperature reached 97 and 94 degrees on the 20th and 21st of July, respectively.

The coldest temperatures recorded during the summer were 41 degrees at Pierre on the 19th of June, 35 at Mobridge on the 19th of August, 35 at Sisseton on the 21st of August, 38 at Watertown on the 19th and 21st of August, and 34 degrees at Aberdeen on the 19th of August. On July 6th, record low high temperatures were set at several locations across the area. The temperature at Wheaton only reached 55 degrees, while Sisseton only reached 58 degrees. At Aberdeen, the temperature only reached 63 degrees, while Timber Lake reached 67 degrees by the end of the day.

You may be asking yourself whether a cool summer has any relationship to the upcoming winter. The findings show that there is little relationship between cool summers and cold winters. However, with a weak to moderate El Niño forecast to occur in the South Pacific through the winter (see article on page 6), the Climate Prediction Center forecasts the winter to have above normal temperatures across central and northeast South Dakota as well as west central Minnesota. The precipitation forecast for this winter is indeterminate with no clear indication for above or below normal precipitation across the area.

special cold wave

## LEWIS AND CLARK: PIONEERS IN METEOROLOGY, TOO

Add meteorology to the list of pioneering achievements associated with the 1804-1806 expedition of Captains Meriwether Lewis and William Clark. The finding is uncovered by Susan Solomon and John Daniel of the National Oceanic and Atmospheric Administration's Aeronomy Laboratory in Boulder, Colo., in a paper published in the September issue of the *Bulletin of the American Meteorological Society*. NOAA is an agency of the U.S. Department of Commerce.

Scientific observations were a prominent, though lesser-known, aspect of the expedition of discovery by Lewis and Clark. They chronicled flora and fauna, weather observations and astonishingly precise measurements of temperature (until the rigors of the journey claimed their last remaining thermometer). Solomon and Daniel sleuthed the historical records and journals of the era, revealing a wealth of information not only in the writings of Lewis and Clark themselves, but also in the writings of President Thomas Jefferson, four of the expedition team members and others.

Solomon and Daniel compare Lewis and Clark's 1804-1805 data with modern measurements gathered by volunteers of NOAA's Cooperative Observer network at a series of sites along the Lewis and Clark westbound trail. Some of those NOAA sites have a data record that extends back for a century or more.

Solomon and Daniel's analysis shows that Lewis and Clark carried out their observations with skill, tenacity and considerable success. They credit much to Lewis' careful attention to the calibration of the thermometers. As lead author Solomon notes, "Comparison of their data to modern measurements reveals that he and Clark clearly nailed this challenge, just as they did so many others on their pioneering journey."

According to the paper, Lewis and Clark's observations 200 years ago as they trekked across the North American High Plains agree very well with the modern record. For example, they experienced average minimum temperatures for June/July in Montana of about 50°F, in agreement within 2°F with expectations from modern data. They also documented typical spring and fall Western snows, flash floods and warm Oregon winters – features of the climate that often surprised and occasionally plagued these men from the eastern seaboard of the then-United States.

Jefferson, best known as one of the Nation's Founding Fathers, was keenly interested in a variety of subjects, including meteorology. As the paper notes, Jefferson took meteorological observations himself and likely instructed Lewis before the journey.

As a surveyor, Jefferson had a vision for a clear delineation of the United States coastline to reduce shipwrecks while expanding commerce and industry. Jefferson created the Coast and Geodetic Survey (CGS), to focus on the importance of geodesy, the science of measuring the size and shape of the earth, and the nation's coasts. After a federal reorganization in 1970, part of CGS became National Geodetic Survey, falling under the NOAA umbrella.

Susan Solomon is a senior scientist at the Aeronomy Laboratory in Boulder, Colo., where she leads the Chemistry and Climate Processes research program. She is the recipient of many honors for her pioneering work in discovering the cause of the Antarctic ozone hole, including the 1999 U.S. National Medal of Science and the 2004 Blue Planet Prize.

John Daniel is a research physicist at the Aeronomy Laboratory. His work on the science associated with climate and the ozone layer was recognized with the Presidential Early Career Award for Scientists and Engineers in 1996.

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## 2004/2005 Winter Outlook

